

REMARKS

I. Status of Claims

Upon entry of the Amendment, which is respectfully requested, claims 27 and 30-55 will be pending in the application. Claims 34-52 are withdrawn from consideration.

Claim 27 is amended to incorporate the subject matter of claims 28 and 29. Accordingly, claims 28-29 are canceled without prejudice or disclaimer. Claim 27 is further amended to recite that “a carbide layer is formed at an interface between said substrate and said current-collector,” with support in the present specification at, for example, page 9, lines 11-13.

Claims 53-55 are added. Support for claim 53 can be found, for example, at page 27, lines 24-26 of the specification. Support for claim 54 can be found, for example at page 28, lines 21-23 of the specification. Support for claim 55 can be found, for example at page 9, lines 21-23 of the specification.

A Request for Continued Examination is being filed concurrently and no new matter is added. Accordingly, entry of the Amendment is respectfully requested.

II. Response to Claim Rejection Under 35 U.S.C. § 102

Claim 27-32 are rejected under 35 U.S.C. § 102(b) as allegedly anticipated by Nobuaki (JP 2002-056863).

Applicants respectfully submit that claims 27 and 30-32 are patentable over Nobuaki, at least for the following reasons.

Claim 27, as currently amended, recites that “a carbide layer is formed at an interface between said substrate and said current-collector” of an electrode used in a fuel cell. This feature is essential in achieving the object and advantageous effects of the invention, for example, to bring the substrate and the current-collector in close contact with each other, enhancing the electrical connection between them, contributing to a higher output power of the fuel cell. See, for example, page 8, lines 20-29 of page 8; page 9, lines 1-6; and page 9, lines 11-13 of the present specification.

In contrast, the fuel cell disclosed in Nobuaki does not have an electrode structure where a layer of carbide is sandwiched between a substrate and a current-collector. In other words, Nobuaki does not specify that a carbide layer within the electrode is flanked by a substrate and a current-collector. See, for example, Fig. 1 of Nobuaki.

Furthermore, at paragraph [0009] of Nobuaki, it is generally stated that electrodes 3 and 4 are “carbon electrodes.” Still further, Nobuaki indicates that the current-collectors 6 and 7 are made of nickel material with a gold coating. According to Nobuaki, the electrically conductive adhesive layers 8 and 9 are, for example, the product Dodent manufactured by Nohon Handa. Nobuaki further describes that curable silver of the epoxy type, acrylic type, or urethane type, etc., containing metallic particles such as silver, etc., may be used as the conductive adhesives. Nobuaki further suggests that alloy type adhesives made of gold and silicon, etc., may also be used as the conductive adhesives. See paragraph [0010] of Nobuaki. Therefore, Nobuaki does not disclose a (substrate)-(carbide layer)-(current-collector) structure.

In view of the above, claim 27 is not anticipated by Nobuaki. Claims 30-32 are also patentable, at least by virtue of their dependence from claim 27. Accordingly, Applicants respectfully request reconsideration and withdrawal of the § 102 rejection of claims 27 and 30-32 based on Nobuaki.

III. Response to Claim Rejection Under 35 U.S.C. § 103

Claim 33 is rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Nobuaki in view of Vaidyanathan (U.S. Patent No. 4,585,711).

Applicants respectfully traverse.

Claim 33 is patentable over Nobuaki, at least by virtue of its dependence from claim 27. Vaidyanathan does not cure the deficiency of Nobuaki. Therefore, claim 33 is patentable over the combination of Nobuaki and Vaidyanathan.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the § 103 rejection of claim 33 based on Nobuaki in view of Vaidyanathan.

IV. Patentability of Claims 53-55

Applicants respectfully submit that claims 53-55 are patentable over any reasonable combination of Nobuaki and Vaidyanathan, at least by virtue of their dependence from claim 27, and also for the following reasons.

Claim 53 recites that “the current-collector is bonded to the substrate by thermally annealing the current-collector,” while claim 54 recites that “the current-collector is bonded to

the substrate by brazing these two components to each other.” Bonding the current-collector and the substrate in these ways enhances the adhesion between the current-collector and the substrate, which prevents the internal resistance of the fuel cell from increasing.

Claim 55 recites that “noble metal such as Au, Ag, Cu, or Pt is contained within the body of the current-collector.” This feature contributes to the reduction in the electrical resistance of the current-collector. See, for example, page 9, lines 24-25 of the present specification. As a result, the electrode of the fuel cell can be made thinner, smaller, and lighter in weight. See, for example, lines 26-27 of the present specification. Furthermore, the use of noble metal in the current-collector makes the current-collector less prone to corrosion. See, for example, page 9, lines 28-29 and page 10, line 1 of the present specification.

In contrast, Nobuaki does not have an electrode structure where a layer of carbide is sandwiched between a substrate and a current-collector, and Vaidyanathan does not cure the above deficiency in Nobuaki.

Therefore, Applicants respectfully submit that claims 53-55 are patentable over any reasonable combination of Nobuaki and Vaidyanathan.

Conclusion

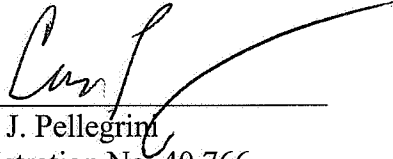
In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.114(c)
U.S. Application No.: 10/519,105

Attorney Docket No.: Q85456

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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